

A. Destouy.
Sewing Machine.

N^o 95571

Patented Oct. 5, 1869.

Fig. 2.

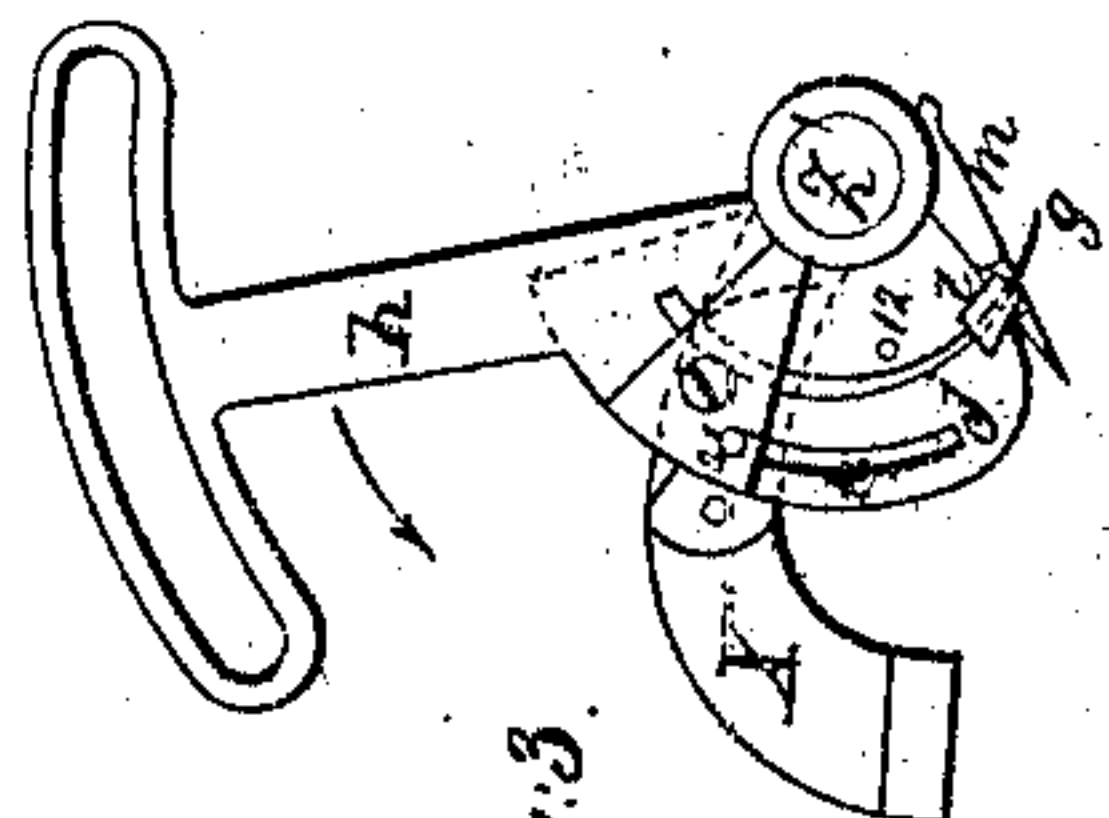
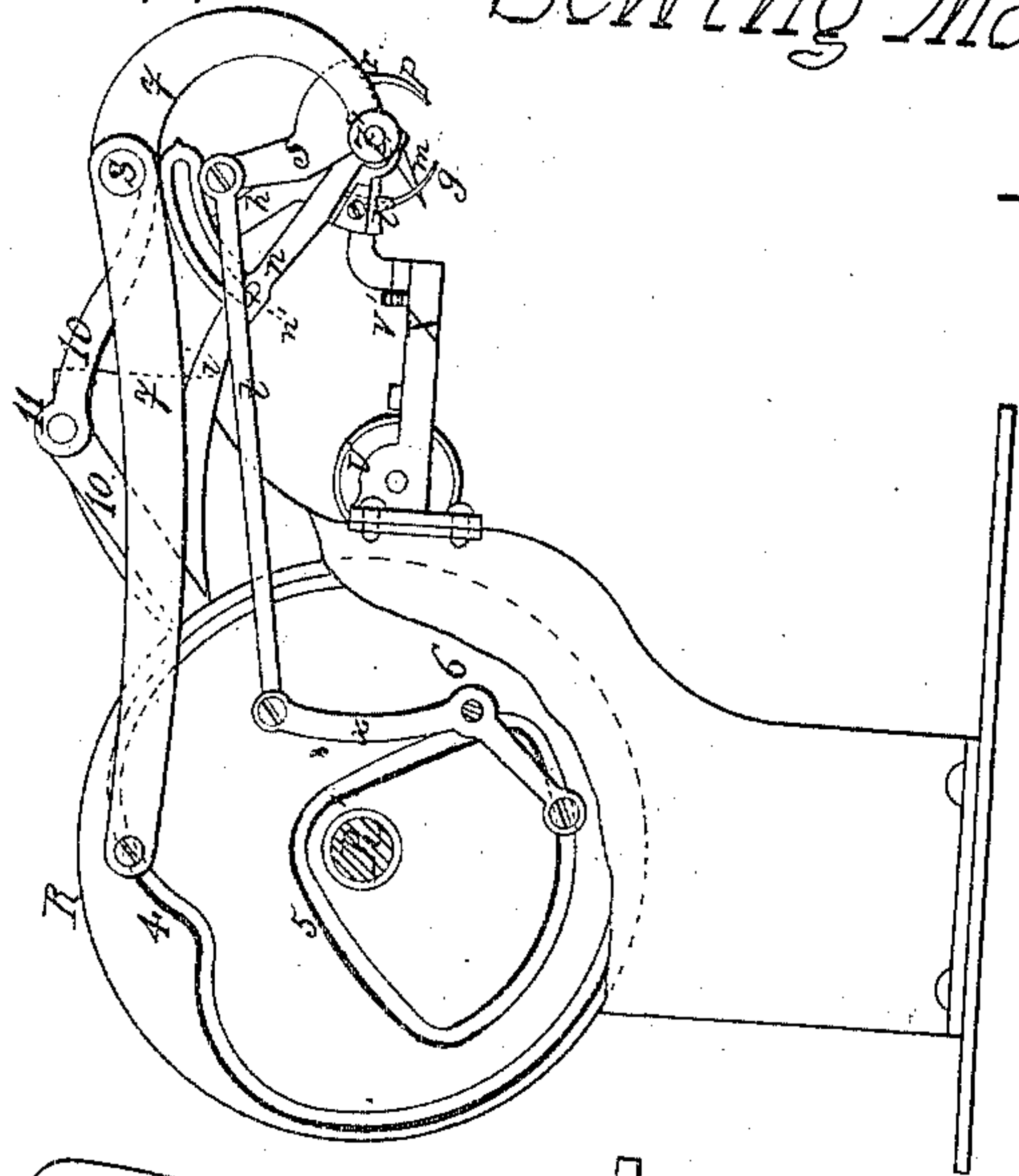


Fig. 3.

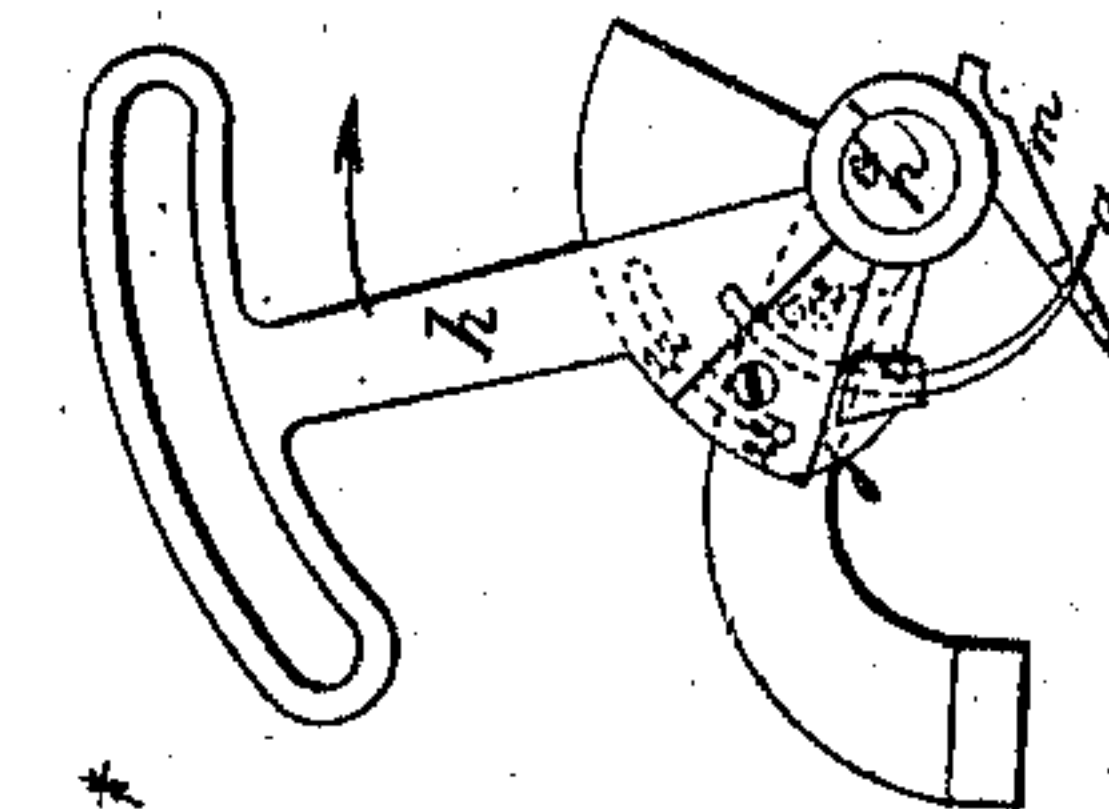


Fig. 3*.

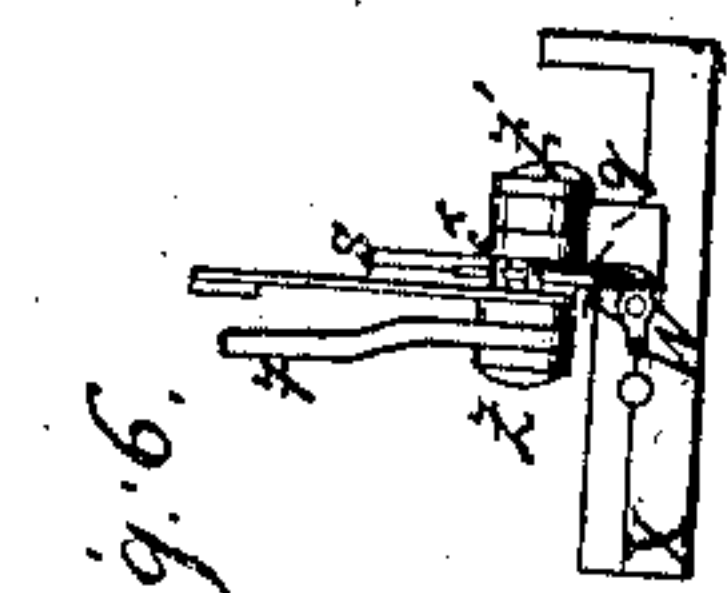
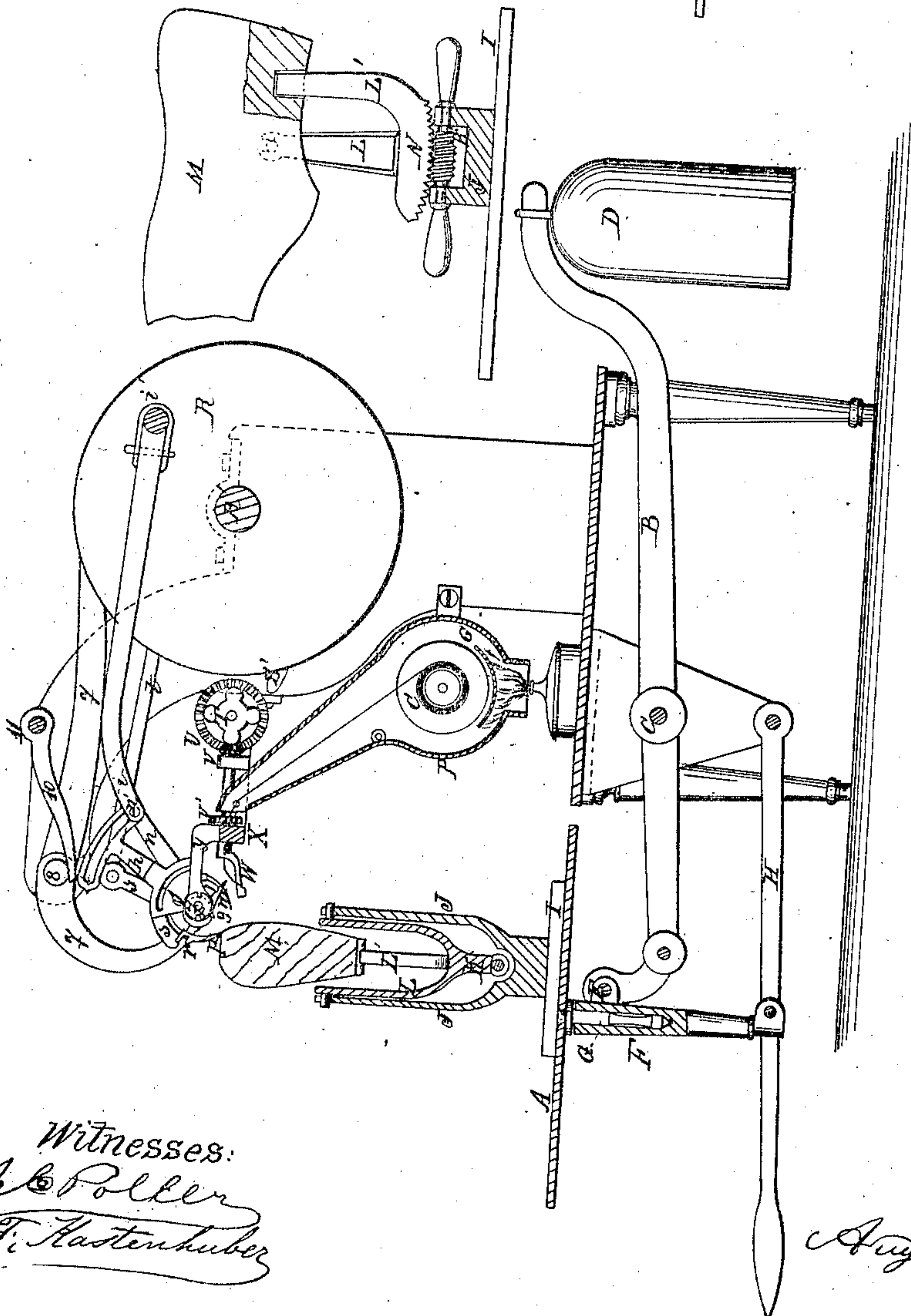


Fig. 6.

Fig. 1.



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Fig. 5.

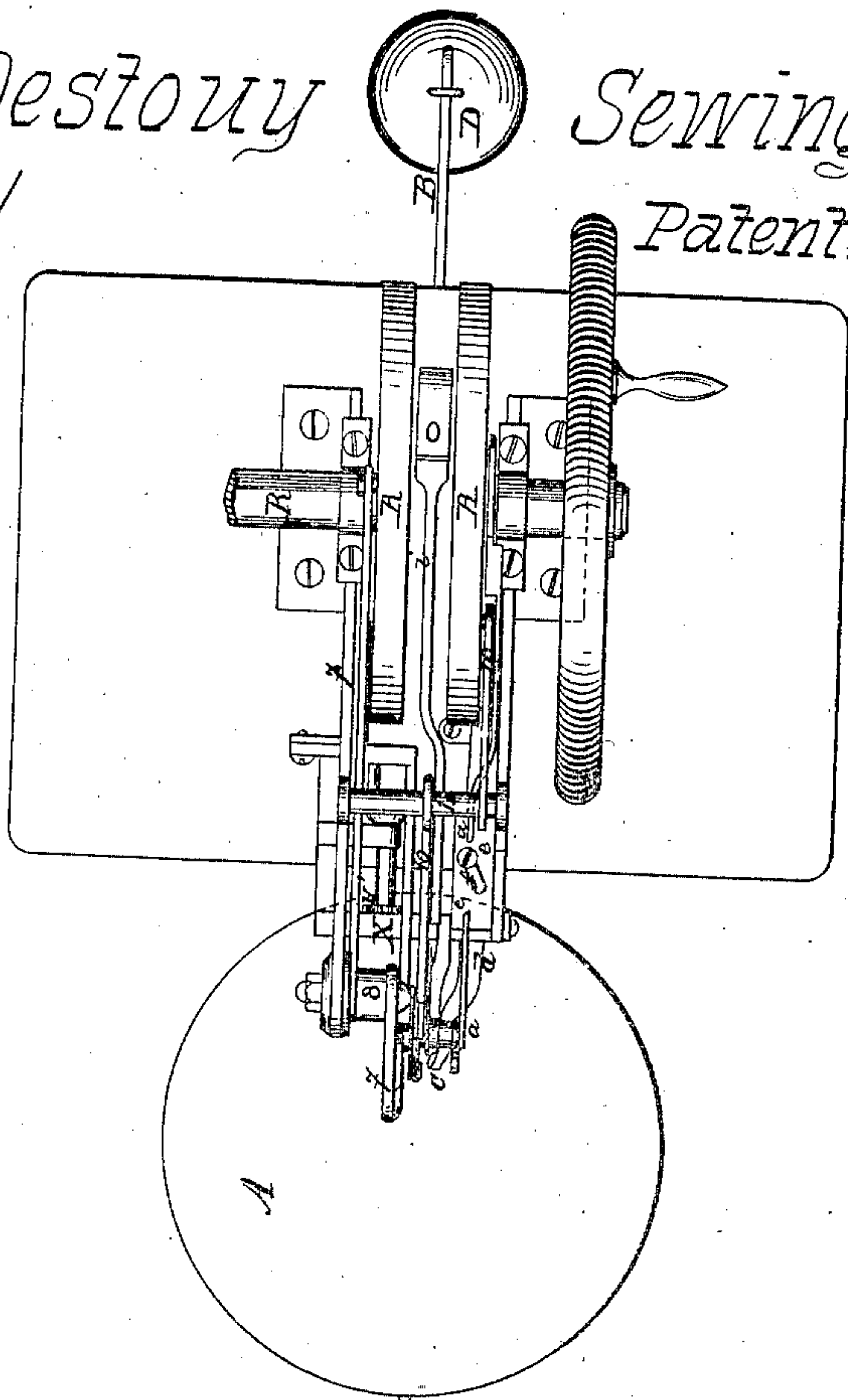
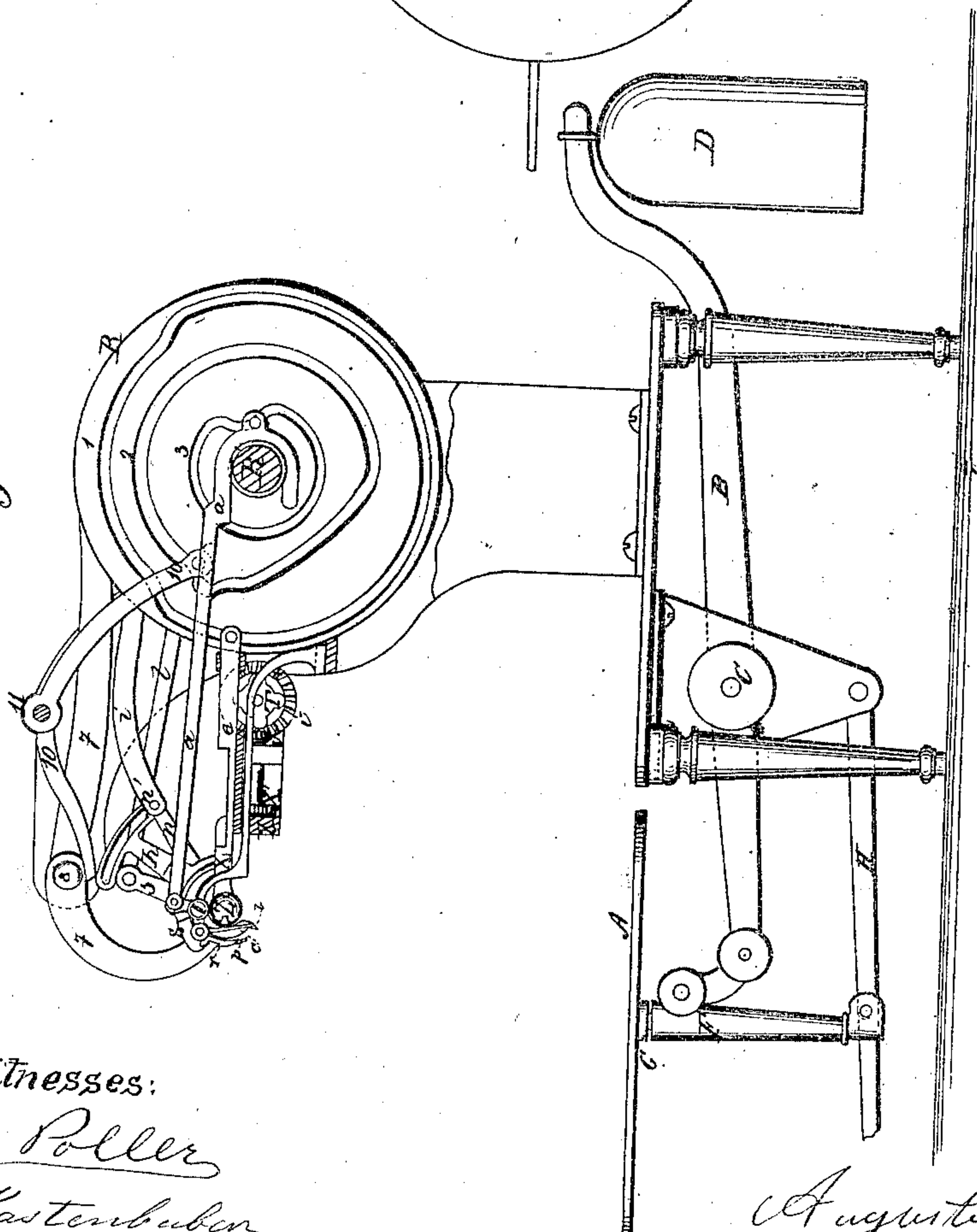


Fig. 4.



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UNITED STATES PATENT OFFICE.

AUGUSTE DESTOUY, OF NEW YORK, N. Y., ASSIGNOR TO CHARLES GOOD-YEAR, JR., OF SAME PLACE.

IMPROVEMENT IN SEWING-MACHINES FOR BOOTS AND SHOES.

Specification forming part of Letters Patent No. 35,571, dated October 5, 1869.

To all whom it may concern:

Be it known that I, AUGUSTE DESTOUY, of city, county, and State of New York, have invented a new and useful Improvement in Machines for Sewing Boots and Shoes; and I do hereby declare the following to be a full, clear, and exact description thereof, which will enable those skilled in the art to make and use the same, reference being had to the accompanying drawing, in which—

Figure 1 is a side elevation of the machine, partly in section. Fig. 2 is an elevation, in section, of part of the mechanism from the opposite side. Fig. 3 is an enlarged view of the awl-stock and of some of the adjacent parts detached. Fig. 4 is the machine shown in Fig. 1, the last-holder being omitted. Fig. 5 is a plan view of the machine, and Fig. 6 is a front view of part of the sewing mechanism.

This invention relates to that class of sewing-machines for which Letters Patent of the United States were granted to me February 18, 1862, and July 31, 1866.

The present invention consists in a novel construction of the last-holder for supporting the work, in such a manner that such work can at all times be brought in the desired relation to the needle and awl; also, in giving to the crochet-needle a certain motion away from its center, around which it oscillates, in such a manner that the loop to be formed is drawn out to the desired length, and at the same time the stitch previously made is drawn up tight; furthermore, in the combination, with the device for drawing out the loop or for producing the movement of the needle away from its center of motion, of a shield or needle-guard operating concentrically with said needle, substantially as hereinafter described.

The letter A designates the table which supports the work. The table is supported by the vertical post F, which is hollow, and receives a pin, G, from the bottom of the table, so that the latter can be freely rotated in a horizontal plane. The post is supported by two levers, which are connected to it at its top and bottom, respectively, and their construction and arrangement are such as to produce a parallel motion in the post and table, whatever the changes in their elevation may be.

To the lower part of the frame of the machine, at C, is pivoted the lever B, which, for greater strength, and to obtain steadiness, is made double for the greater part of its length. The forward end of said lever is connected to the upper end of post F, by being pivoted to ears H which project from it, and its rear end is weighted by the adjustable weight D.

To an ear on the lower end of the post is connected a parallel lever, H, whose rear end is pivoted to the machine, vertically, below the pivot C of lever B, the forward end of said lever H being extended forward beyond the post, and formed into a handle for raising and lowering the levers, and so adjusting the table A to the required height.

The work is placed on a last, M, supported by a last frame or holder, L, which has three vertical arms, one of which, the rear one, having a squared end, enters a socket made in the last behind the instep, and holds it, so that it cannot move independently of the frame.

The other two arms of the frame are arranged on each side of the last, and the whole frame is hung by means of lugs projecting from these arms, which rest in open bearings on the top of the vertical standards J J, so that the last-frame can vibrate on the standard, and be removed and replaced at pleasure. The standards J J unite at the bottom in a long, narrow, flat platform, which lies upon the table A without being fastened thereto, being free to be moved on the table by the operator, according to the progress of the sewing. The last-frame is vibrated to raise or depress the toe or heel of the last, as may be required, to bring these parts into proper relation to the awl and needle, by means of a worm, K, which is arranged in the platform I between the standards J J, and engages a curved rack formed on the bottom of said frame L. The worm, by means of handles formed on its ends, is operated to throw the heel or toe of the last up or down.

By means of the devices above described the work is placed in the required position to the sewing mechanism, the table being raised to the proper height, the last adjusted to the proper level by the worm and rack, the platform which carries the last-holder moved to

the proper position on the table A, and the table itself rotated by the hand of the operator as the sewing progresses.

From the above explanation it is apparent that the work is borne or pressed upward constantly toward the sewing mechanism by the operation of the weight D, the sole of the shoe bearing against the feed-dog *c*, which constitutes a sewing-gage, and projects into the channel cut along the edge of the sole to receive the stitches following the curves and depressions of the last.

The feeding and sewing mechanism derive their motions from two disks, R R, which are mounted on separate shafts R'. The feeding mechanism consists of a feeding-dog carried by and working within a gage or guide for guiding the work in the intervals between the stitches. The letter *b* designates the feed-dog. It is mounted on the forward end of an elbow-lever, pivoted to the feed-bar, and is united with the feed-gage, as shown in Figs. 4 and 5. The other end of the said elbow-lever is connected to one end of a rod, having at its other end a pin or anti-friction roller, which moves in a cam-groove, 3, formed in the face of one of the disks R. The rod *a* is so arranged that its forward end is capable of a lateral motion along with the feed-bar.

The letter *c* designates the feed-gage, whose edge runs in the channel in the sole. It is rigidly connected to the feed-bar *d*, which extends backward, and is attached to the frame of the machine in such a manner as to allow of both the feed-bar and feed-dog being moved laterally back and forth.

The lateral movements of the feed-dog and its bar or stock are derived from the cam-groove 1 of one of the disks R, acting on the slotted bar *e*, which extends forward and slides upon the part X of the frame of the machine. The slot in bar *e* is diagonal to the direction of its motion, which is confined to a right line by suitable guides in the part X, and said slot receives a pin, (seen in the plan view, Fig. 5,) which projects upward from the face of the stock *d* of the feed-dog.

It results from this arrangement that the vibrations of the bar *e*, acting by its slot on the pin of said feed-bar or stock, gives to the latter the reciprocating motion which is required.

The stitch made by the machine is the well-known chain, and it is produced by the devices hereinafter described. On the spindle or axis Z, which is supported by the extension of the frame X, is mounted an awl-stock, *h*, the upper part of which is formed into an arc slotted concentrically with its center of motion. Through its slot, and into a slot in the arm of the needle-stock *n*, projects a pin, *n'*, which is fast to a connecting-rod, *i*, that extends backward, and is coupled by the crank-pin *j'* to the two cam-disks R R.

By these means the awl-stock receives partial rotation on its axis, the movements of the connecting-rod being communicated to it when-

over the pin *n'* strikes the ends of the slotted arm. The awl (seen at *g*, Figs. 1, 2, and 3) is curved concentrically with its center of motion, and is forced through the leather by a lever, 10, which continues the rotation of the awl-stock, after the connecting-rod *i* has drawn the said stock backward to the full extent of the throw of its crank *j'*. The lever 10 is elbow-shaped, and its fulcrum is formed by a spindle, 11, located in bearings in the highest part of the frame of the machine, the rear arm of said lever having on its end a pin or anti-friction roller, which moves in the cam-groove 2 of one of the cam-disks R, while the free end of the forward arm extends over the awl-stock, so as to come in contact with the slotted arc, when said connecting-rod *i* has reached the end of its receding movement. The cam 2 is so timed as at this moment to vibrate lever 10 and actuate its forward arm downward on the slotted arm of the awl-stock and continue its movement, and thereby drive the awl with a steady force through the leather.

The awl is steadied during its passage through the leather by a stationary rest, *m*, which projects backward from arm X, at a point beneath the spindle Z, said rest being recessed at one side to form a passage for the awl. The said rest *m* also forms a stripper, to strip the leather and welt of the shoe from the awl as the latter retires. The awl is also supported and guided during its movements by the shield *l* which surrounds it, and through which it is free to move. This shield is formed on the lower edge of the vibrating quadrant *j*, which is mounted on spindle Z next to the awl-stock, which is in part hid by it in the views, Figs. 1 and 4. The quadrant *j* and awl-stock *h* are seen from the other side in Figs. 3 and 3*. Said quadrant is provided with a slot, 22, which is concentric with its center of motion, and in this slot moves a pin, 21, which is secured in the awl-stock. When the awl-stock *h* moves in the direction of the arrow, marked near it in Fig. 3, it carries the quadrant *j* with it by friction to the position shown in said figure—that is, until the shield *l* strikes the stripper *m*. At that point the quadrant stops, and the awl-stock continues to move in the same direction, carrying the pin 21 from the upper end of the slot 22 to its lower end, and forcing the awl through the leather. During this portion of the operation the shield *l* is kept close to the leather, and the awl is materially strengthened in performing its function. When the motion of the awl-stock is reversed the quadrant *j* moves with it by friction until the pin 12 strikes a shoulder of the arm X. (See Fig. 3*.) At this point the motion of the quadrant stops, and the awl-stock completes its motion in the direction of the arrow, (shown near it in Fig. 3*,) thereby carrying the pin 21 back again to the upper end of the slot 22, when the needle retires. The needle or hook *p* is drawn to a curve, having the same radius as the awl, but

its point is opposite that of the awl, and it moves in an opposite direction, so as to follow the point of the awl as the latter recedes, and it enters the hole made by the awl in the work. The needle is fixed upon a stock, which is mounted, to revolve freely upon an oscillating spindle, Z' , hung in the end of a lever, 7, which vibrates on a pivot, 8, and is moved from the cam-grooves 4 of one of the cam-disks at certain times, to wit: while the needle or hook is going through the leather the spindle Z' coincides with the spindle Z , but when the needle has left the work the spindle Z' is oscillated and projected in a forward direction by the cam 4, so as to carry the needle or hook outward clear of the work, whereby the new loop is drawn out to the required length, and at the same time the old stitch is drawn up tight. The needle-stock is then revolved in a backward direction, so as to be ready for a new stitch, and before it comes to a state of rest the spindle Z' is carried backward again into line with spindle Z . The vibration of the needle on its spindle is effected by the connecting-rod i and its pin n' that works in a slot in the needle-stock n . The barb of the needle is covered at certain times by protector q , (seen in Fig. 6,) which is a front view of a portion of the sewing mechanism. Said protector is curved like the needle or hook, and projects from a vibrating-plate, S , which is mounted on spindle Z' , so as to turn freely thereon, being vibrated from a cam, 5, on one of the cam-disks R , through the elbow-lever x , which is pivoted at 6 to said cam-disk, the upper longer part of said lever x being pivoted to the rear end of a connecting-rod, t , whose forward end is attached to the top of plate s .

The needle p is supported in its movements by two guides, r , (seen in Figs. 1 and 6,) both of which guides form rigid parts of the plate s , and in this example the protector q is directly attached to said guides, and through them to the said plate s , said protector being on the outer side of said guides, and the needle or hook p consequently in going through the guides passes between the protector and the flat surface of the plate s . Said guides serve to steady the needle as it passes into and out of the leather, and the lower guide serves also as a stripper to strip the leather or welt or other work from the needle when the latter recedes from it.

The cam-groove 5, which gives motion to the plate s and to the protector q , is so timed as to cause said protector to remain stationary after both the needle and the protector have gone through the hole made in the work by the awl, while the needle or hook p , the movement of which is derived from the crank i , continues to advance until its barb is uncovered and is brought opposite to the rotating thread-carrier W , hereinafter described, which throws the thread around its barb and forms a loop, which is drawn by the needle

(which next begins to retire) through the leather, where it is rejoined, and its open side covered by the protector, and both thence move together out of the work, the protector serving to retain the loop on the barb and protecting the leather from being injured by the barb, and also stiffening and strengthening the hook or needle p .

When the needle and protector are raised or brought clear of the work, the feed of the material takes place, and the loop is thereby drawn sidewise, and by the next descent of the hook it is opened or bulged, the protector at that time remaining stationary and allowing the loop to expand laterally beyond its point, so that when the same next descends it passes into the loop and resumes its place alongside the hook to close it, with the loop outside of the protector.

The hook and protector, in traversing the leather the next time, leaves the loop behind, and when they return bring with them a new loop, which they draw up through the old one; and, as the needle is projected outwardly, this old loop is drawn up tight and the new loop is drawn out to the required length. It is of the greatest importance to sew with the thread and wax at a high temperature. The thread is drawn from a reel or spool, O , which is mounted on a spindle in a closed heater, P , that is attached to a convenient part of the frame. Said heater is formed as shown in Fig. 1, where one side is taken away, its bottom being open to admit the flame of a lamp to act directly on a curved plate, Q , which deflects the flame and heated air and gases, and directs it toward the sides of the heater and around the spool, at the same time protecting the body of the thread from contact with the flame. The top of the heater is carried upward to the height of the thread-carrier, or nearly to that height, and the thread is thence conducted through the shank and axis of the thread-carrier, as seen in Fig. 1, on its way to the work. The thread-carrier W is sustained by the part X of the frame in such a manner that it can revolve in its supports. Its forward end, where the thread emerges, is bent to a right angle, so that its delivering end describes a circle around the hook p , when the latter is in place to receive the thread. The carrier is revolved at the proper times in one direction only, by means of a cam, S' , on the periphery of one of the cam-disks, R , which strikes successively, in its rotary travel, one of the four cam-studs, T , formed on the face of the wheel U , transmitting its motion through bevel-gear teeth formed on itself to a small bevel-gear, V , and thence through the shaft of the latter to two toothed wheels, V' , the smaller of which is formed on the inner end of the hollow carrier, the gears and wheels being so arranged that a complete revolution of the carrier is effected during the time that the wheel U is performing one-quarter of a revolution.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The last-holder, adjusted by the means and in the manner substantially as herein shown and described.

2. The needle having a movement away from its center of motion after it has been drawn out of the work, substantially as herein shown and set forth.

3. In combination with the device for drawing out the loop or for producing the movement of the needle away from its center of motion, a shield or needle-guard operating concentrically with said needle, substantially as herein shown and described.

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